

**Diabetes Overview with Dietary Strategies**

**Satellite Conference and Live Webcast**  
**Wednesday, November 7, 2012**  
**2:00 – 4:00 p.m. Central Time**

Produced by the Alabama Department of Public Health  
Video Communications and Distance Learning Division

**Faculty**

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**Pathophysiology**

- **Chronic metabolic disease**
  - **Lack of, or ineffective use of insulin**

**Pathophysiology**

The diagram illustrates the pathophysiology of diabetes in five steps: 1. The stomach changes food into glucose. 2. Glucose enters the bloodstream. 3. The pancreas makes little or no insulin. 4. Little or no insulin enters the bloodstream. 5. Glucose builds up in the bloodstream. The diagram shows a cross-section of the stomach, a blood vessel, and the pancreas, with arrows indicating the flow of glucose and insulin.

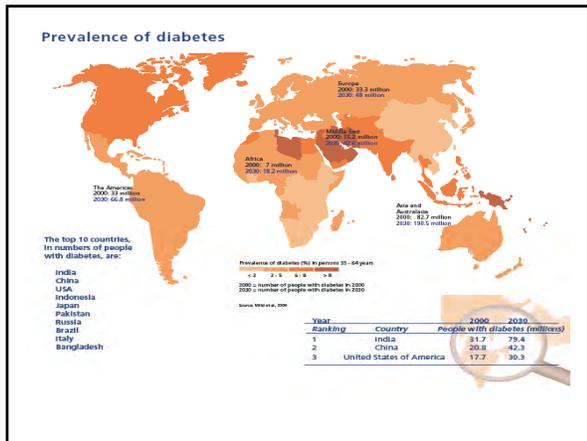
1. The stomach changes food into glucose.
2. Glucose enters the bloodstream.
3. The pancreas makes little or no insulin.
4. Little or no insulin enters the bloodstream.
5. Glucose builds up in the bloodstream.

**Prevalence: United States**

- **25+ million people**
- **79 million estimated: prediabetes**
- **High risk in:**
  - **Hispanic / Latino Americans**
  - **Native Americans; Alaskans; Asian Americans**
  - **African Americans**

**Aging Issue**

- **27% over 65 years of age**



- ### Criteria for Diagnosis
- **A1C > 6.5%**
  - **Fasting blood glucose >126 mg/dl**
    - No caloric intake for 8 hours
  - **2 hour plasma glucose >200 mg/dl during oral glucose tolerance test**
  - **Random plasma glucose >200 mg/dl with classic symptoms of hyperglycemia**

### Target Blood Glucose

Target	ADA	AACE
FBS mg	90-130	<110
After meals mg	<180	<140
A1C	<(6) 7%	<6.5%

- ### Type 1 Diabetes
- **Previously insulin dependent diabetes**
  - **Complete insulin deficiency due to beta cell destruction**
    - Genes
    - Environment – Idiopathic
    - Autoimmunity

- ### Type 1 Diabetes
- **Usually occurs before age 30, but can occur at any age**
  - **Ketosis prone**

- ### Type 2 Diabetes: Etiology
- **Genetic defects**
    - Immune-mediated syndromes
  - **Exocrine and endocrine disorders**
  - **Drug / chemical induced**
    - Steroids, beta blockers, thiazide, nicotinic acid
  - **Infections: Rubella, CMV**

### Symptoms of Type 2 Diabetes

- Blurry vision
- Increased thirst or need to urinate
- Feeling tired or ill
- Recurring skin, gum, or bladder infections
- Dry, itchy skin
- Unexplained weight loss

### Symptoms of Type 2 Diabetes

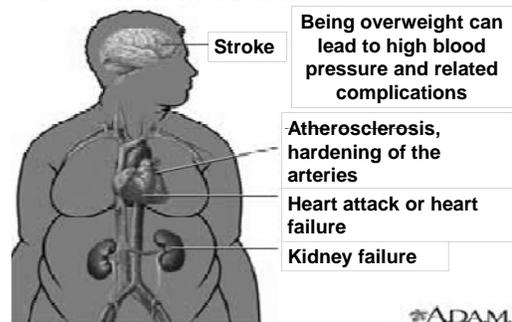
- Slow-healing cuts or bruises
- Loss of feeling in the feet or tingling feet

### Metabolic Syndrome / Prediabetes / Impaired Glucose Tolerance

- Hyperinsulinemia / Hypertension
- Lipidemia
  - Low HDL
  - High triglycerides
  - Small, dense LDL

### Metabolic Syndrome

- 70% die from CV disease



### Acute Complication of Diabetes

- Type 1: Diabetic Ketoacidosis
- Symptoms of Acidosis
  - Central
    - Headache
    - Sleepiness
    - Confusion
    - Loss of consciousness
    - Coma

### Acute Complication of Diabetes

- Muscular
  - Seizures
  - Weakness
- Intestinal
  - Diarrhea

### **Acute Complication of Diabetes**

- Respiratory
  - Shortness of breath
  - Coughing
- Heart
  - Arrhythmia
  - Increased heart rate

### **Acute Complication of Diabetes**

- Gastric
  - Nausea
  - Vomiting

### **Acute Complication: Hypoglycemia**

- Low blood sugar symptoms include:
  - Headache
  - Shaking
  - Sweating
  - Feeling tired
  - Weakness
  - Hunger

### **Acute Complication: Hypoglycemia**

- Treat low blood sugar: 15 / 15 rule
  - Check blood sugar
  - Eat 15 grams of carbohydrate
  - Wait 15 minutes for sugar to get into blood

### **Treatment of Hypoglycemia**

- 15 / 15 rule
- If next meal is more than 1 hour away, eat one CHO choice
- Always carry food source

### **Treatment of Hypoglycemia**

- 15 grams of CHO:
  - 3 glucose tablets
  - 4 oz. juice
  - 8 life savers
  - 1 T. jelly

### **Long-term Complications**

- **Vascular complications**
  - 50% at time of Type 2 diagnosis
- **Macrovascular**
  - Cardiovascular disease
- **Microvascular**
  - Retinopathy, nephropathy, neuropathy

### **Diabetes Treatment**

- **Diet / weight management**
- **Physical activity**
- **Monitoring**
- **Medication**
  - Type 1: Insulin
  - Type 2: Oral
    - May require Insulin

### **Medical Management**

- **At least annually:**
  - HgbA1C: below 7%
  - LDL cholesterol: below 100
  - HDL: over 45
  - Maintain BP less than 130/80
  - Microalbuminuria
  - Dilated eye examination

### **Medical Management**

- Foot examination
- Assess smoking status
- May prescribe aspirin to decrease vascular risk

### **Education**

- **Regular meal schedule**
- **Avoid concentrated sweets**
- **6 - 8 glasses water daily**
- **Activity daily**
- **Regular medication schedule**
  - Generics
- **Regular medical follow-up**

### **Education: Vulnerable Populations**

- **Simple materials / languages**
- **Interpreter**
- **Teach in phases**
- **“Learn and do”**
- **Individual and group**
- **Follow-up**

### Diabetes Costs

- **American Diabetes Association reports monthly costs of \$350 - \$900**
  - **Costs the U.S. \$24 million a year**
- **Average costs:**
  - **\$9,677 for Type 2**
  - **\$14,856 for Type 1**

– Dall, Zhang, et.al., 2010

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### Diabetes Costs

- **Costs expected to double in next 25 years**

– Huang, E., et. Al, 2009

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### Are We Poor or Broke??

- **“New-poor”**
- **Poor: persistent state**
- **Broke: temporary**

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### Who Are Those with a “Poor Income”?

- **Rural**
- **Uninsurable**
- **Immigrants**
- **2009 poverty rates highest in 51 years**
  - **Number of families in poverty 8.8 million (Urban Institute)**

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### Misperceptions About “Rich Eating”

- **Misperception**
  - **Diabetic foods are very expensive**
- **Reality**
  - **The proper foods for diabetes are both healthy and affordable**

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### Food Stamp Nation 2011

44,082,324 Americans are on food stamps. Every state in red adds up to a little over 44 million people.

### Food Stamps

- Includes
  - Most foods, soft drinks, candy, cookies, snack crackers, ice cream, seafood, steak, bakery items, energy drinks with nutrition facts, seeds and plants to grow

### Food Stamps

- Excludes
  - Non-food items, alcohol, pet food, heated foods

### Survival Tactic # 1

- Budget
- Take food inventory
- Action plan
  - Weekly menu
  - Lists
- Family participation
- Keep it simple

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### Survival Tactic # 2

- Be a “Centsible” shopper
- Set savings goal
  - Example, save \$50 / month = \$600 / year
- Cost comparison
- Shop in one trip

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### Survival Tactic # 2

- [www.grocerysavingtips.com](http://www.grocerysavingtips.com):
  - For frugal cookbooks, frugal recipes

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### Survival Tactic # 3

- Grocery smarts
  - Sale items are the “loss leaders”
    - Aim is to get customer in store
  - Displays at end of aisle are more expensive
  - Healthy foods at perimeter of store

### **Survival Tactic # 4**

- **Cooking patterns**
  - Cook once / eat twice
  - Slow cooker, toaster oven, microwave,
  - Grill
    - Less energy and more convenient than oven or stove top

### **Survival Tactic # 5**

- **Home gardening**
  - “You are what you eat!”
- **Healthy, sustainable foods,**
- **Endorsed by American Nurses Association, 2010**

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### **Survival Tactic # 6**

- **Couponsing**

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### **Survival Tactic # 7**

- **Do your “fast food” cooking at home**

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### **Survival Tactic # 8**

- **Love those cheap, high fiber, protein rich beans!**

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### **Survival Tactic # 9**

- **“ Rainbow” eating**
  - Veggies and pasta

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### **Survival Tactic # 10**

- **Fiber**
  - Whole wheat, bran, fresh or dried fruits, and vegetables

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### **Survival Tactic # 11**

- **Simple eating with eggs and milk**

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### **Survival Tactic # 12**

- **Eat seasonal foods when they cost less**

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### **Survival Tactic # 13**

- **Have healthy, cheap snacks**
  - Air popped popcorn
  - Cheese sliced from bulk
  - Pumpkin puree in puddings / cake mixes
  - Fruit or vegetables

### **Resources for Food**

- **Dial 2-1-1: nearby food pantries**
- **Seek local social service agency**
- **Seek religious organizations, community centers**
- **Meals on Wheels**
- **Feedingamerica.org: food bank locator**

### **Resources**

- **Best practices – American Diabetes Association**
- **American Association of Diabetes Educators**
- **Alabama Department of Public Health**
- **Local education centers**

## Resources

- **Google-language tools, Migrant Clinicians Network**
- **Diabetes companies / Drug assistance**

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